APPENDIX 3

Operational Approval for Procedures Requiring

SPECIAL AIRCREW AND AIRCRAFT AUTHORIZATION

Other than Specials

The criteria/requirements needed to support linear TERPS surfaces based upon 2 x RNP without a secondary area are yet to be determined.

The following represents a work in progress.

1. Background. Standard RNP RNAV IAP obstruction clearance areas rely on aircraft certification of RNP RNAV capability under AC 20-RNP (DRAFT). The probability of exceeding the obstruction clearance area during the conduct of an RNP-RNAV procedure shall be less than 1×10^{-9}. The FAA will provide IAPs with RNP RNAV minimums labeled "**SPECIAL AIRCREW AND AIRCRAFT AUTHORIZATION REQUIRED**" that will have reduced obstruction clearance areas. Use of these minimums may require a combination of aircraft equipment beyond the equipage required by AC 20-RNP along with training, operational procedures and constraints to maintain the requisite target level of safety despite a reduced obstruction clearance area. FAA Flight Standards personnel shall determine whether or not the additional equipage, training, operational procedures and constraints provide an equivalent level of safety and mitigate the additional risk of reducing the obstruction clearance area for a special procedure when the impact of these applications cannot be conveniently modeled to determine an impact on the achieved level of safety. To be authorized to use **SPECIAL AIRCREW AND AIRCRAFT AUTHORIZATION REQUIRED** RNP RNAV minimums, operators under 14 CFR Parts 121, 125, 129 and 135 must obtain appropriate authorization through their CMO(IFO) or CHDO and those under Part 91 must obtain authorization from their FSDO.

2.0 Requirements. The RNP RNAV equipment certification, operational procedures, and use of additional equipment must combine to provide:

a. Equipment certified to a minimum of the RNP RNAV requirements of AC 20-RNP (DRAFT).

b. The probability of the aircraft exiting the lateral limits of two times the RNP value without annunciation of failure of RNP RNAV capability must be less than $1x10^{-6}$ per hour.

c. The probability of loss of RNP RNAV capability must be less than $1x10^{-5}$ per hour.

d. The following RNP RNAV leg types must be supported by the aircraft equipment/operation:

1. Required Functions: Capability to execute leg transitions and maintain tracks consistent

with the following ARINC 424 path terminators, or their equivalent:

Initial Fix (IF),

Track between Two Fixes (TF),

Course to a Fix (CF)

Course from a Fix to an Altitude (FA),

Direct to a Fix (DF)

Holding Pattern to a Manual Termination (HM)

Holding Pattern to an Altitude (HA)

Holding Pattern to a Fix (HF)

Constant Radius to a Fix (RF).

Notes: Path terminators are defined in ARINC Specification 424, and their application

is described in more detail in documents RTCA DO-236A/EUROCAE ED-75A,

DO-201A/ED-77. The RF leg type is unique to RNP-RNAV systems whereas the other types may exist in non-RNP systems.

e. Possible equipment options for risk mitigation could include:

(1) The aircraft must have dual RNP RNAV avionics that meet hazard level associated with the proposed operation/procedure.

(2) The RNP RNAV avionics must incorporate dual IRUs and dual FMCs.

(3) The RNP RNAV avionics must be based on GPS. Multi-sensor equipment must have the capability of inhibiting ground-based NAVAID updating.

(4) The aircraft must have a flight director or autopilot certified for instrument approach.

(5) The aircraft must have other systems installed and operational e.g., EGPWS or TAWS system with a current database, that provide the requisite risk mitigation not accounted for by the navigation systems.

3. Operational Procedures.

a. A RAIM prediction must be accomplished during dispatch that indicates that the requisite RNP RNAV performance based on GPS will be available during the period one hour prior to one hour after the planned approach period.

b. The IAP must be flown using the flight director or coupled.

c. The EGPWS or TAWS must be operational during the IAP.

d. The avionics must be set to inhibit the use of ground based navaids.

e. Flight crews must receive training to cover as a minimum:

(1) General knowledge and application of RNP RNAV.

(2) A thorough understanding of the equipment required for RNP RNAV operations and its limitations.

(3) Operating procedures and safeguards necessary to maintain the required navigational performance.

(4) Training in contingency procedures in the event RNP RNAV capability is lost.